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ABSTRACT

In this report of a working conference, experts in the teacher education field considered the adequacy of current research on teaching practices and obstacles in the implementation of changes based on research findings. In "How Useful Are the Findings from the Research on Teaching," Jane A. Stallings discussed findings from research on teaching which appear most amenable to translation into staff development activities. Richard C. Williams, in "Changing Teacher Behaviors: From Symbolism to Reality," presented an analysis of school contexts from an organizational perspective, and of the way these contexts impinge upon changing teacher practice. In "An Expanded View of the Student Outcomes That Are Built or Restrained by Teaching Processes and Structures," Beatrice A. Ward considered a variety of student outcome variables which might be used to assess teaching effectiveness. Sara Edwards asked conference participants to respond to a series of questions about research and teacher education for "Recommendations for Study on Changing Teacher Practice." A "Summary of the Discussions" at the working conference, prepared by Heather Carter, discussed issues surrounding use of research as a basis for change in teacher practice, the current knowledge base to address these issues, and the needed knowledge base to address these issues. A list of the conference participants is appended. (JD)

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CHANGING TEACHER PRACTICES: PROCEEDINGS OF A NATIONAL CONFERENCE

Maria E. Defino and Heather Carter

Editors

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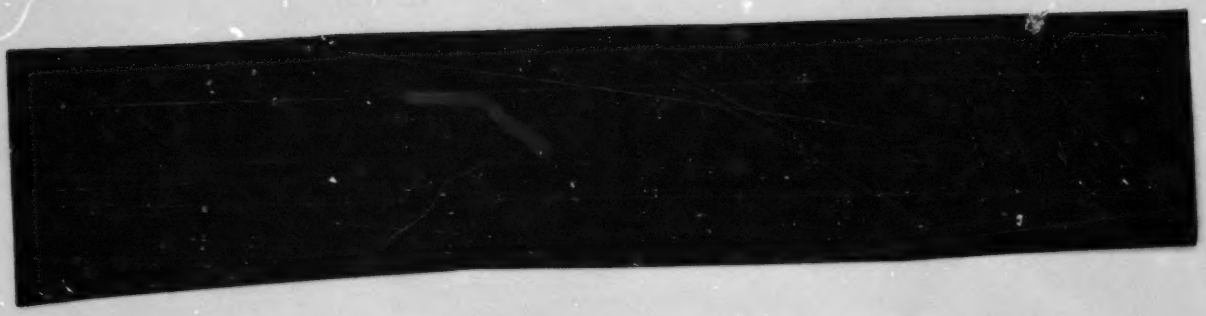

Research in Teacher Education Division

Gary A. Griffin, Program Director

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Abstract

In order to guide and inform the conceptualization of a quasi-experimental study on staff development, a group of 13 experts with varying professional orientations were invited to attend a working conference. Three papers were commissioned to direct participants' efforts. In chapter 1, Jane A. Stallings discusses those findings from research on teaching which appear most amenable to translation into staff development activities. Richard Williams presents in chapter 2 his analysis of school contexts from an organizational perspective, and the way these impinge upon changing teacher practice. Beatrice Ward offers for consideration a variety of student outcome variables which might be used to assess teaching effectiveness in the third chapter. Participants were asked to respond individually to a series of questions prepared by the RITE staff; these have been summarized by Sara Edwards in chapter 4 of the proceedings. A list of the conference participants is appended.

Introduction

In October 1981, the Research in Teacher Education (RITE) Division of the Research and Development Center for Teacher Education convened a working conference on "Changing Teacher Practice." The purpose of the conference was to bring together a group of experts to obtain their guidance in conceptualizing and designing a new research effort focusing upon staff development. So as to obtain diversity in perspectives and therefore a broad scope of input, the participants were drawn from several different professional orientations: staff developers in school systems, educational researchers, school system representatives, teacher educators, and teacher organization representatives (see Appendix).

In addition, three papers (chapters 1-3 of this text) were commissioned to lend direction to conference work. Jane Stallings, President of Teaching and Learning Institute, presented her views about which findings from research on teaching might lend themselves to translation into staff development efforts. Richard Williams, University of California, Los Angeles, discussed the place of school contexts from an organizational perspective as they relate to bringing about changes in teacher practice. Lastly, Beatrice Ward, Deputy Director of Far West Laboratory for Educational Research and Development, presented for consideration some student outcome variables other than the typical scores on standardized tests, which could be used to indicate the effectiveness of teacher practices.

After conference participants were given the opportunity to hear each of these presentations, they were asked to work in small groups to present further recommendations, ideas, and comments to guide the RITE research effort. In addition, each participant was asked during an afternoon session to respond individually to a series of open-ended questions

prepared by the RITE staff. The latter set of comments have been summarized in chapter 4 by Sara Edwards, Research in Teacher Education staff member.

It should be noted that the conference participants actively worked with each other and with the materials at hand for many hours; we were most pleased with their productivity! More important, the quality of their work has been demonstrated repeatedly to those of us at RITE through its continued utility to the conceptualization of the staff development research effort.

At this time, special thanks must be given to Susan Barnes, Sara Edwards, Vicky Rodgers, and all of the RITE staff, for their successful efforts in planning and executing all the arrangements for the Changing Teacher Practice Conference. In addition, I would like to express my deep gratitude to Freddie Green for her phenomenal speed and accuracy at the keyboard of RITE's word processor. Her unfailing sense of humor and willingness to dedicate time and energy to this task greatly facilitated the process of preparing these proceedings.

M. E. D.

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How Useful Are the Findings From the Research on Teaching?

Jane A. Stallings

The Teaching and Learning Institute

What have we learned from the classroom research of the 1970's that can be useful to guide instructional practice in the 1980's? The most potentially useful variable to emerge from the past decade of research was time. However, Philip Jackson (1977, p. 38) wisely noted:

> There has been a lot of talk about the importance of time in the determination of educational outcomes...Certainly, we should take a look at how time is being used or misused in our schools. It may indeed turn out to be the culprit that critics claim it is. As we test this possibility, however, we must keep in mind that time itself is valueless. It acquires value chiefly because it marks the expenditure of a precious commodity--human life...let us not seize too quickly at remedies for our educational ailments that call for little more than adding days or hours to our present efforts. The real key lies in making better use of the time we already have.

Many educators are now convinced that if student time-on-task is increased, an increase in student achievement will follow. While keeping students on-task may seem like a simplistic notion, it is a rather complex undertaking to make this construct useful in the classroom. Teachers need to know more than just to allocate additional time to academic activities and to keep students on-task. They need to know how to make expectations clear to students; how to use time effectively in a variety of activities; how to vary time with different achievement groups; and how to provide appropriate

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lessons and support to keep students on-task. Research in the 1970's focused on the length of school days, actual scheduled class time, time allocated to academic subjects, teacher planning, and engaged time. Although these factors have most often been studied separately, they do interrelate. The length of the school day or class period is a school level policy and relates to how much time is available for academic studies. Within the available time, teachers decide how the time will be used. These teacher decisions relate to whether or not students stay on-task. The purpose of this paper is to illuminate those research findings that are specific enough to be useful and yet are considered as singular events isolated from the context of the classrooms and school.

Length of School Day

The length of a school day in elementary school or the length of a class period in secondary schools defines the maximum amount of time available for instruction. Harnischfeger and Wiley (Note 1) found that the length of school days in the same district varied by 45 minutes for two second grade classrooms. However, the variance of the actual time spent in class was only eight minutes. First grade classrooms in the National Follow Through Observation Study (Stallings, 1975) varied as much as one hour and 30 minutes in length of school day; secondary class periods for remedial reading varied from 40-55 minutes (Stallings, Needels, & Stayrook, Note 2). Findings from these studies indicate that mere length of the school day or the length of a class period in secondary schools was not related to student academic achievement. Clearly, student learning does depend on how the available time is used, not just the amount of time available.

Academic Learning Time

Researchers at Far West Laboratories initiated the idea of Academic Learning Time (ALT) in the Beginning Teacher Evaluation Study (BTES) (Fisher, Filby, Marliave, Cahern, Dishaw, Moore, & Berliner, Note 3). ALT had three basic components. The first was the time available for academic work; the second was the students' time-on-task; and the third was the error rate or the appropriateness of the seatwork. The latter was computed primarily from the errors students made in homework or seatwork.

Powell and Dishaw (in press), reporting data from the BTES, indicated that the actual time allocated to academic studies for second graders ranged from 62 minutes to 123 minutes per day, and for fifth graders from 49 to 105 minutes per day. The correlation of allocated learning time with achievement varied from one test to another in this study. However, in the Follow Through Observation Study (Stallings, 1975), time spent in mathematics, reading, and academic verbal interactions was related to achievement. Time spent working with textbooks (as opposed to time spent with puzzles, games and toys) was related to achievement in reading and math. Time spent in small groups (as opposed to one-to-one instruction) was also associated with student academic gain. Conversely, time spent in more exploratory activities was positively related to scores on a nonverbal problem-solving test and to a lower student absence rate. Similar relationships were also found in a study of California third grade Early Childhood Education classes (Stallings, Cory, Fairweather, & Needels, Note 4).

It is of interest to know what percentage of time allocated to academic subjects is used by students to engage in academic work. Powell and Dishaw, in the BTES Study cited above, reported that the engaged time of second grade students varied from 38 minutes to 98 minutes, and that of fifth grade

students varied from 49 to 105 minutes. Student engaged time was positively associated with student achievement in all tests and at both grade levels. Summative findings reported by Berliner and Rosenshine (1977) suggest that the more Academic Learning Time students accumulate, the higher their scores will be on criterion tests.

Achievement Levels and Academic Time

The variation in the amount of student engaged time by achievement groups was reported by Evertson (Note 5). On the average, low achieving junior high students were engaged 40% of the time in academic activities compared with 85% engaged time for high achieving students. Low achieving students experienced less variation in the activities that occurred during the class period and had more "dead time" (nothing happening) than did the more able students.

Even though high achieving students are more inclined to be engaged in academic tasks, it is of considerable importance to allocate sufficient time and effort to working with low achieving students who may not be so inclined. Stallings (1975) reported that low achieving third graders in Follow Through prospered more from an increase in time spent in reading and math than did the higher achieving students. Caution: for all students, there is a point at which more time does not produce more learning. Such curvilinear effects have been reported by Soar (Note 6).

Clarity of First Day Organization and Planning

Work by Evertson and Emmer (Note 7) focused upon the organization of 102 junior high school English and math classrooms. Several characteristics differentiated more and less effective teacher-managers. In classrooms where there was less student misbehavior and more student gain through the year:

1. Teachers made rules, consequences and procedures clear on the

first day. This included teachers monitoring the students and following through with consequences for those who did not comply.

2. Teachers established a system of student responsibility and accountability for work on the first day.
3. Teachers were skillful in organizing several instructional activities.

Time Distributed Across Activities

A study by Stallings, Cory, Fairweather and Needels (Note 4), identified strategies for teaching basic reading skills in secondary schools. These included distributing time across activities, interactive instruction, and the focus of instruction. In classrooms where teachers were efficient in making assignments and allocating materials, there was more time available for instruction and students gained more in reading. It is important to start on time and continue until the closing bell rings. The distribution of time across several activities during the class period was also an effective strategy for keeping students on task. Effective teachers in three studies of secondary schools distributed time in the following ways:

Organize / Management Activities (15%)

- Take role
- Make announcements
- Make clear expectations for quality and quantity of work
- Clarify behavioral expectations
- Pass papers or books (out and in)

Interactive On-Task Activities (50%)

- Review / discuss previous work
- Inform / instruct (demonstrate / give examples)
- Question / check for understanding

- Reteach small group (if necessary)
- Read aloud / develop concepts

Non-Interactive On-Task Activities (35%)

- Written work
- Silent reading
- Teacher monitoring / guiding

The percentage of time allocated to each of these activities varied across classrooms according to the achievement level of students. Interestingly, an ample amount of oral reading was helpful for the low achieving students, but was not so important for students achieving above the 4th-grade level. The oral reading was handled through lessons where vocabulary had been carefully developed, and where teachers helped students develop work concepts within a small group setting of students with similar reading skills. Students who are operating at this level need to hear and say the words as well as read and write the words. These students can usually pronounce or sound out words but often do not understand words in the context of a story. Secondary students' comprehension scores are often lower than their vocabulary scores. Oral reading allows the teacher to hear the student's reading problems, ask clarifying questions, provide explanations to help students comprehend new words, and link the meaning to students' prior experience or knowledge.

Students who were in classrooms where slight or no gain was made spent more time than other students on written assignments (28%) and silent reading (21%). They had less instruction, discussion/review, and drill/practice. Some of these students were assigned to spend entire periods working in workbooks with very little instruction from the teacher. Such classrooms

often registered more student misbehavior. Students with reading problems are likely to have shorter attention spans and the opportunity to be involved in several activities during one class period seemed to help these students stay on-task.

Interactive Supportive Instruction

During the study of how teachers allocated time to various classroom activities it became clear that teachers who were interactive in their teaching style had students who achieved more in reading. This interactive style included providing oral instruction for new work, discussing and reviewing students' work, providing drill and practice, asking questions, acknowledging correct responses and supportively correcting wrong responses. It was important that teachers try to include all students in classroom discussions and review sessions. The effective teachers did not call upon volunteers but rather called upon a particular student. When volunteers are solicited, the same people take part each day and many students may not be involved at all. When calling a student by name it is important to ask a question at a level where the student is most likely to be successful. However, if the student gives an incorrect response it is important that the instructor stay with that student and rephrase the question or give a clue so that the student can succeed and give a correct answer. A wrong answer can provide an opportunity for the teacher to clarify and reteach, if necessary. It is important in secondary remedial classrooms that wrong responses are handled in a supportive manner since research indicates these students do not thrive on demeaning experiences of failure.

This interactive type of instruction is important when teaching subjects other than remedial reading. Good and Grouws (Note 8) found junior high school students learned more mathematics in classrooms where teachers were

active in their instruction. These teachers made assignments and provided information in a clear manner. They asked students appropriate questions and provided immediate feedback to student responses. Unfortunately many teachers of general math students are not active in their teaching style. In a study of math classes in 11 schools, Stallings and Robertson (Note 9) found that teachers more often told general math students to do written workbook assignments in class and less often gave them instruction or review of seatwork than they did students in geometry or calculus classes. In classrooms where students are more involved, more achievement occurs. Students in general mathematics or pre-algebra were off-task significantly more often than were students in albegra II, geometry or calculus classes.

Eleven of the teachers in the study were observed in both lower and advanced math classes. When the observations of the teachers were compared, we found the same teacher would be active with advanced classes and not active with the lower classes. These low-achieving students need instruction from teachers to stay on task. Programmed workbooks will not help them learn the mathematical relationships necessary to cope in life. A teacher can see in students' faces whether or not they understand. A teacher can select another example from the students' background and explain it on the chalkboard. The most important finding in this research is that teachers need to actively teach. The advanced classes received active instruction and the less able students in general science classes received workbook assignments. This is not effective instruction for low-achieving students. Relationships similar to those described in mathematics classes were found in general science and physics classes.

Focus of Instruction

If teachers are interactive in their instructional style, to whom should they focus their instructions: individuals, small groups, or the total group? During the last decade considerable energy has been directed toward the development of individualized programs. Federal, state and local funds have been spent to develop programmed reading, mathematics and science books. All of these programmed materials were aimed at providing children with activities in which they could progress at their own rates. It was assumed that if students were working at their own pace through a series of sequential exercises, learning would occur--it did for some students and not for others. In general, there has been a great disillusionment with individualized instruction. Some students learn best when new information is presented to a small group of students who are operating at a similar pace (Stallings, Needels, & Stayrook, Note 2; Stallings, 1975). Learning occurs when students read aloud, and hear others ask questions and respond. Hearing and speaking as well as reading and writing help students integrate and retain information. Individualized programs based almost totally on workbooks do not allow for this type of group learning.

At a conference sponsored by the National Institute of Education regarding instructional dimensions, sixty teachers discussed their experience with and attitudes towards individualized instruction. Teachers reported that in most individualized programs they felt relegated to being record keepers. Where workbooks were relied upon to provide instruction for students, teachers felt unable to integrate the students' learning (Amarel & Stallings, 1978). It appears that students need interactions with teachers. A teacher can develop concepts with a group and can change examples or illustrations to coincide with the group's background experience. If

students do not understand, the teacher can find yet another example. Books or machines do not do that. Books or machines provide opportunities to practice and reinforce what teachers are teaching, but research suggests they are not sufficient to provide the instruction that students need (Stallings, 1975).

Student Understanding of Lessons

Educators and researchers have been concerned for some time about whether students understand and learn from the work they do. Mastery must include understanding as well as getting the right answer on the test. Thelen (Note 10) reports high school students who can sound out words, pronounce them, and even fill in the blank in a workbook correctly but not comprehend the material. Students have learned to memorize the right answers but not understand relationships. In this case, they have memorized to forget.

Anderson (Note 11) in an observation study of elementary school children, asked individuals such questions as: How did you get this answer? What are you learning when you do this page? A large proportion of the children were not able to give a specific response. The low-achieving students had strategies for finishing the page--such as copying or asking someone for the right answer--but displayed very little understanding of the material.

While conducting the Study of Teaching Basic Skills in Secondary Schools, Stallings et al.'s (Note 2) observers reported that effective teachers of low-achieving students ended instruction with questions or statements like: "What do you think happens next?", "Tell me in your words how the story ended.", "Give me an example of an opposite meaning." All of

these are efforts to check for understanding. If the student did not understand, the teacher would reteach it.

It is the opinion of this author that many of the high school students who fail the competency exams are the products of school curricula that require students to complete a series of workbooks in reading, math, science and social studies. They memorize through drill and practice for tests and never transfer the information from their short term to their long term memories. Information transferred to long term memory where it can be retrieved and used must be organized in some way and linked to other information already in the long term memory. Ausubel (1965) said "The most important single factor influencing learning is what the learner already knows." Research is needed to find how teachers can help students learn strategies for linking new information to what is already known.

Curriculum and Instructional Strategy

Much of the research on student learning during the 1970's has focused upon classroom instructional processes, i.e., teaching processes rather than curriculum. Work by Carroll (1963) and Bloom (1974) provided models for planning instructional processes and curricula that would insure student mastery. Hyman and Cohen (1979) suggest seven techniques that will increase participation and thereby insure mastery. The techniques are listed as follows:

a. Define instructional objectives behaviorally so that learner and teacher know exactly where they are, where they are going, and where they have been.

b. Modularize learning by cutting down the bites to small, self-contained nibbles. Closure is the most potent of all positive feedback techniques. The smaller the bite, the more immediate

the closure.

c. Control the stimulus so we know exactly what the learner is responding to. That is a major problem in commercially published materials.

d. Go directly to the defined behavior -- that is, direct reaching of the behavior or "attitude" sought rather than "building to it" or around it.

e. Check for understanding and provide immediate feedback to all learner responses. The more immediate the feedback, the more efficient the learning.

f. Rig the level of instruction so that feedback is maximally positive. Success breeds success and lots of "warm fuzzies" too.

g. Reinforce by positive feedback the learner's critical response. The critical response is the one that responds to the appropriate stimulus defined precisely by the instructional objectives.

How Much Confidence Shall We Place in These Findings?

The question of confidence in research findings raises several issues: was the research responsibly conducted? Was the sample large enough? Were the instruments reliable? Were the statistics appropriate? All of the studies mentioned here have passed the inquisition of their colleagues and the educational boards of professional journals.

Another test of confidence must be: are the findings useful? Most of the research reported in the previous pages is believable. Teachers and principals are likely to say, "Of course students will learn more when time is available and when students stay on-task." To be useful, the findings must be specific enough to suggest how to plan lessons, how to select

seatwork, and how to provide interactive instruction so that the students will stay on-task.

In an effort to make their research findings useful to teachers, several researchers, Anderson, Evertson, and Brophy (1979), Good and Grouws (1979), Crawford, Gage, Corno, Stayrook, Mitman, Schunk, and Stallings (Note 12), and Stallings, Needels, and Stayrook (Note 2), translated their findings into inservice training. They conducted experiments with treatment and control teachers. All of these experiments reported teacher change and positive effects upon students.

Several of the studies mentioned in this paper did not result in efforts to train teachers. Nevertheless, the findings have been reported in such specificity that teachers or teacher trainers can translate findings into practice. The Beginning Teacher Evaluation Study (Fisher et al., Note 3) does present descriptions of how much time is spent in several activities: reading circle, seatwork, silent reading, games, transition, teacher presentation. Also reported is the percent of students involved, attendance of students, teacher's role and student's role. These findings are being used by teachers and trainers of teachers.

Does the Research To Date Address the Most Pressing Concerns of Teachers?

Teachers in general are concerned about students who are lacking basic skills and about bright students who are not achieving as they might. The research in the 1970's focused primarily upon students who needed remediation. Research in the 1980's should shed more light on effectively teaching the average and gifted students.

Teachers are also concerned about diminishing school budgets that limit supplies and curtail school services. Some schools no longer have counseling

or psychological services available, for example. They are also concerned about teaching subjects and students for which they are not prepared. The tenured staff must teach students who need remediation and few teachers are prepared to do so. Research is needed to identify effective models for providing effective inservice education.

During the past four years, this author has provided inservice training to over 200 secondary teachers. The training program provided teachers with specific recommendations for using time more effectively. The sessions were very interactive and, in every group, the teachers reported school policy or principal leadership style that supported or discouraged their implementation of our program. Their primary concerns were with students being absent, tardy, and misbehaving. If the school policies on such matters were firm, clear and consistent, teachers felt more able to implement the program. Teachers were also concerned about the number of interruptions during a class period. The loudspeaker, students being called from class, or the late arriver--all of these stopped the smooth flow of instruction and took students off-task.

A study by Stallings and Mohlman (Note 13) examined these links between school policy, leadership style, teachers' and students' attitudes and teachers' and students' behavior. The study was conducted in eight San Francisco Bay Area high schools that had multi-ethnic student populations from low to high income families. The data were obtained from principal interviews, student and teacher questionnaires and school and classroom observations. Scatterplots, Pearson Product Moment correlations, and descriptive statistics were used to analyze the data. The major findings from this study were:

- In schools where policies and rules were clearer and more consistently enforced, there was higher teacher morale, fewer classroom intrusions, less litter and vandalism, a lower absence rate, less class misbehavior, and more time-on-task.
- In schools where there were more administrative support services and fewer burdensome duties, there was higher teacher morale and less classroom misbehavior.
- In schools where the principal was more collaborative and respectful, teachers had higher morale and students felt more friendliness.
- In schools with more supportive principals, more teachers implemented the training program.
- In schools where the policies and rules were clear and consistent, more teachers changed their classroom behavior as recommended.
- In schools where the teachers implemented the Effective Use of Time Training program, students spent more time-on-task.
- Findings regarding effective school policy and principal leadership style were similar for schools serving high income and low income students.

Primarily this research serves as a source for building hypotheses; however, two findings from this study have cost implications. (1) Student attendance rates were significantly better in schools where the principal provided a clear, consistent, collaboratively developed policy regarding student absence, cuts, and tardiness. It was also important that these policies were well-communicated to parents, students and teachers. (2) In schools with such policies, fewer dollars were spent on vandalism. The

primary source of school income is the average daily attendance of students. A source of cash outflow is school repair for vandalism. During a time of shrinking school budgets, these findings regarding school policy, student absence and vandalism have important implications for school administration.

Building a Theory of Schooling

The nature of effective schooling has piqued the curiosity of researchers for many decades. John Dewey did not conduct formal research but he had good hunches about how students learned. He set up environments where students could experience learning as well as read about events. John Dewey's theory guided practice and research for many years. The theories of B.F. Skinner, Carl Rodgers, and J. Piaget have also guided teaching and research.

In the last decade, we have studied schools in isolation, classrooms in isolation from schools and students in isolation from classrooms and schools. Findings regarding the percent of student time-on-task will not necessarily help a teacher do a better job. The teacher needs school policies that will support the good use of classroom time. The teacher also needs specific information about which students are off-task during which activities, so that adjustments can be made.

The charge of the 80's is to study the whole school context, taking into consideration administration, teachers, and students, together. The results of this research combined with the empirical findings generated during the research in the 1970's may enable us to generate a comprehensive and practical theory of effective schooling.

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Changing Teacher Behavior: From Symbolism to Reality

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There seems to be little question that American public education is presently facing a serious crisis. The origins of the crisis are many; some are societal, e.g., declining population, rising social disorder with the resultant crime and vandalism, shifting priorities that divert funds away from social programs. These and other external conditions and developments have decreased the resources available to education and complicated the already difficult tasks that the public schools have been called upon to perform.

But another, internal, cause of the educational crisis is the public schools' malfunctioning. The popular press, e.g. Time ("Help! Teacher Can't Teach," June 1980), reports numerous instances of teacher incompetency and administrative inability to efficiently and effectively deliver educational services, and there has been a concomitant decline in student achievement.

At this working conference we are examining one facet of the internal problems facing the schools: how to improve teacher performance and the role inservice training might play in such improvement efforts. To be sure, ineffective teacher classroom behavior is but one part of the problem. Other factors, such as inept administrators and student antisocial attitudes, contribute in turn to teacher ineffectiveness. Because of the influence these other factors have, it seems unlikely to assume that teacher classroom performance can be or will be improved by teachers alone. Thus in my paper I will attack the problem as not only a teacher's responsibility but also as a school district's responsibility.

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In this paper I want to present a perspective, a point of view, rather than a fully developed argument. There are two reasons for my tentativeness: one, my thinking about how best to improve teacher behavior has been changing over the last year or two and I have not yet fully formulated these new thoughts and two, I understand the spirit of this conference to be one of inquiry and exploration--it would be inappropriate to present and fiercely defend a particular viewpoint. You (conference participants) represent various roles in the educational system--I look forward to your reactions.

Let me state a few caveats and warnings. I will often refer in general to "American Education." As you know, that enterprise--American Education--is enormously varied, largely decentralized, and very complex. Generalizing about American Education is a risky business at best. I realize that there are likely many exceptions to my generalizations. Also, my paper is based on assumptions underlying work in progress on teaching effectiveness. My interpretation of this work may be limited--I welcome your comments. Finally, my argument may challenge assumptions and beliefs held by some of you. I am not trying purposefully to be provocative; my purpose is to try to shake all of us out of orthodox thinking--something I think necessary if we are going to make progress in improving teacher behavior.

Let me briefly outline the paper that follows. First I will describe why school districts can be described as institutionalized and therefore attend to teacher behavior and teacher effectiveness in essentially a symbolic way. Then I will discuss some recent developments that may allow school districts to deal with teacher behavior more effectively and thereby become more like a technical system, and finally I will discuss the implications this new development might have for school district management.

School Districts as Institutionalized Organizations

A common observation of American public school teachers is they work quite autonomously behind closed classroom doors (Lortie, 1975). To be sure teachers are occasionally visited by principals and other supervisors, especially during their probationary term, but for the most part teachers are largely unsupervised when it comes to the day-to-day interactions they have with their pupils. Similarly, the relationships between each teacher's methods and his/her pupil's learning, are largely unknown or can at best only be estimated (Goodlad, Klein, & Associates, 1974). Thus we have a curious situation where what would seem to be the most important interaction in a schooling system, that is teacher classroom behavior and its effects on pupils learning, is largely unattended to in any direct supervisory manner in most school districts. This is even more surprising when one views the reportedly low level of preparation teachers generally receive before they begin their difficult task (Lortie, 1975). (In California presently there is a bill before the Legislature to require teachers to pass a written test on basic reading and mathematics skills.)

The now fashionable concept of organizational analysis called "loose coupling" (Weick, 1976) helps describe this phenomenon. "Loose coupling" means that in organizations, "units, processes, actions and individuals are typically connected loosely rather than tightly. Thus actions by one agent or element have little predictable relationship to the actions of another element or agent" (Salencik, Note 1, cited in Clark, McKibben, & Malkus, Note 2). Most school districts, when it comes to managing their most important interactions--namely the interaction between teachers and pupils and the effects thereof--are loosely coupled (Meyer, Note 3). One manifestation of this loose coupling is that teacher behavior becomes self-determined and both

effective and ineffective teachers continue their work largely unmonitored by anyone from outside the classroom door. It doesn't seem likely that continuing this pattern will result in any significant improvement in teacher performance.

Why are teacher interaction patterns with pupils and their results only loosely coupled from organizational management? A number of explanations have been offered for this phenomenon. One of the most persistent views expressed whenever school administrators gather at local, state, and national meetings is: "I really want to be an instructional leader but all the paper work and other problems distract me from this important task" (Williams, Hill, & Wuchitech, Note 4). Accordingly, principals take time-management classes and make solemn promises to mend their ways--but teachers remain isolated behind their classroom doors. Others (Goodlad, 1978) feel that school administrators have been going through a phase (a second era) in which they have allowed purely administrative, and therefore peripheral, matters to divert them from their central task, which, in Goodlad's view, should be the school's curriculum and instructional program. Goodlad joins the growing chorus of voices calling upon administrators to reestablish instruction as a top job priority.

In a somewhat similar vein, Erickson (Note 5) feels that educational administration research and training programs have gone awry, focusing as they do on organizational theory, collective bargaining, politics, economics, and the like. They give far too little attention to important questions about what instructional methods and supporting organizational structures will result in the greatest pupil learning. Like Goodlad, he urges a "paradigm shift" in which educational administration refocuses its attention and priorities toward instruction.

Given these rather persistent statements about the need for administrators to attend to instruction, one would expect that today we would find principals and principal preparation programs turning their attention in this direction. I suspect, however, that the "paradigm shift" Erickson calls for has not taken place except in a symbolic manner (Dornbusch & Scott, 1975). School administrators largely do not attend specifically to day-to-day classroom instructional activities. If this is so, what explains this reluctance of school districts and school administrators to address this important concern?

In my view, one of the most penetrating analyses of this phenomenon has been expressed by Meyer and Rowan (1977). They confirm the observation that school districts, when it comes to their technical core (that is the careful monitoring of teacher instructional methods and its result on pupil learning) are indeed loosely coupled. But, they note, it is a mistake to label the typical school district's instructional supervision as totally loosely coupled. Indeed, school districts have many instruction-related activities and standards that are very tightly coupled. They point out that districts pay very close attention to such things as: whether or not teachers are credentialed; whether schools meet various accreditation-related standards such as providing the appropriate number of library volumes per pupil, limiting classroom size, having a published curriculum, and providing inservice training for teachers and administrators. Whether the teachers indeed teach the established curriculum or whether or not credentialed teachers are using sound instructional methods, however, receive little direct district attention other than routine teacher or administrator workshops or inservice training.

Meyer and Rowan regard these activities and similar accreditation-related standards as essentially symbolic acts which, when added together, constitute what the public accepts as an adequate definition of education and what school administrators call instructional improvement. Very little is done by school districts to assure that changes actually take place in classrooms or that teachers achieve the desired results. School administrators, when asked whether or not their schools are good or not, will often answer in terms of symbols, such as the percentage of teachers with advanced degrees, quality of facilities, and soundness of the curriculum, and the decision-making processes. Meyer and Rowan label organizations that behave in this way as institutionalized, as opposed to technical organizations. Institutionalized organizations tend to tightly couple their symbols to their organizational structure; conversely technical organizations tightly couple their organizational structure to their technical core.

Meyer and Rowan offer several reasons why school districts have adopted this institutionalized mode. I will discuss three which are relevant to the perspective I am presenting.

1. Education has a remarkably weak technical core. They assert educators really know little about the relationship between teacher behavior and pupil learning--unlike hospitals or many manufacturing firms for example, which have a relatively strong technical core. It is very difficult and even dysfunctional to tightly link an organizational structure to a weak technical core.
2. School districts over the decades can be thought of as having been very successful, with no need to attend to the technical core. How can school districts be considered successful? If

providing a real and equal opportunity for all children to meet their potential is the criterion--then schools seem clearly and increasingly unsuccessful. However, if the success criteria include steadily increasing budgets, government protection, and a fairly high general public opinion of schools, then schools indeed have been quite successful. For example, school districts over the years have shown consistent budget growth and the curriculum has increased from the basic core to embrace such subjects as driver education, nutrition, and sex education. The number of people employed in school systems has grown steadily over the decades. Clearly, the public has supported the public education with all its institutional characteristics. In terms of organizational survival, the American public school clearly has been a winner!

3. Another reason for the institutionalized character of schools, they argue, is that its behavior is consistent with its assigned role as a social and economic sorting machine. The fact that some children do better than others is, in the public mind, to be expected because not all children are equally endowed with the abilities to meet the demands of schooling--and society. Some are winners, some are losers; and the school cannot be blamed for this. There is no need to look at the technical system because it has only limited power to influence pupil achievement.

Thus in Meyer and Rowan's view the institutional nature of schools is an enlightened response by sensible people to their situation. If schools are

successful as they are why muck about with an unsure technology and perhaps display the weaknesses of the technical core? In the public's mind, a school is a school is a school. So, in spite of their protestations to the contrary, school administrators are not inclined, or professionally able, to pay close attention to their technical instructional core.

In many ways, I am impressed with the Meyer and Rowan thesis. In light of recent developments in education, however, I think there is reason to question whether or not this institutionalized mode must persist. In my opinion, school districts can and should become more technical organizations. Let me clarify that observation by critiquing the Meyer and Rowan analysis; I have reservations about their third reason, and conditions in schools may have changed so as to allow districts to change from their institutionalized posture and become more technical. First, I will express some reservations about their third reason, then make comments on the first two. Meyer and Rowan are not alone in arguing that school districts respond to society's need for a "sorting machine" and are therefore not really interested in looking closely at the interaction between teacher behavior and pupil achievement. Some economists have maintained that the schools have helped sort out people into various economic classes. Speaking of the development of a supply of skilled labor, Bowles and Gintis (1976) state: "Indeed we shall suggest that the maintenance of such a 'reserve army' of skilled labor has been a major, and not unintended, effect of U.S. Education through the years.

Personally I have some difficulty with this as an explanation for the lack of school district attention to the technical instructional core. One reason for my doubt is the complexity of the American educational system.

The argument of those who see some purposeful national policy to deliberately sort people into social classes has to rest on the assumption that there is some group who can effectively influence an entire diversified national schooling system. I have no doubt that some unknown, and perhaps large, percentage of school districts have fulfilled that sorting role. No doubt many continue to do so today. But I believe that many educators do wish to provide an equal opportunity for all their students to achieve at their highest level and they are frustrated by their inability to do so.

I don't think lack of school district desire to improve pupil achievement and life and career chances fully explains the institutionalized character. What may have influenced the problem has been a lack of a technical core--school administrators simply have not known what teacher behaviors and instructional methods most affect and improve pupil achievement. Lacking that core, their behavior has become institutionalized: they have tried to maintain public support through symbolic acts. And until quite recently that strategy has been quite successful. The efficacy of their symbolic acts had resulted in a generally high level of public support. The public had been willing to accept what the schools called education as satisfactory. School districts have not had to attend to their technical core.

But there have been two important changes in recent years. One change is a decline in the public's satisfaction with and support of the public schools. There are many reasons for this, e.g., perceived poor discipline, disagreement over desegregation solutions such as busing, changing opinions regarding whether or not the public schools should have a continuing semi-monopoly over educating America's youth. But a major reason, I would suggest, is the increasingly visible signs that the schools simply aren't

doing a very good job, as evidenced by declining test scores in general and a persistent inability to assist those in the lower socioeconomic strata to improve their academic performance. In spite of all the schools' symbolic acts, the public is crying for better results. Sensing the continuing inability of the public schools to deliver, they are withdrawing their support.

The other important change I perceive is the emergence of a better understanding of the relationship between teacher behavior and pupil achievement which holds promise of developing into a technical instructional core.

The elements of that emerging technology are well known to many of you, and will likely be dealt with at some length by others here, so I will only mention them briefly. A major component has been the findings of the BTES research (Fisher, Filby, Marliave, Cahan, Dishaw, Moore, & Berliner, Note 6) which identified a link between allocated Academic Learning Time and pupil achievement. I would add to that research, the work of those who have been further probing the effect of teacher behavior on pupil achievement and deriving the practical implications of that work (Stallings, 1980). Related to that is the work of those who have been, for several years, drawing upon principles of learning and classroom-proven methods to develop both the science and art of teaching (Hunter, 1971). I would also include the developing technology in competency-based testing which can provide a more direct measure between instruction and pupil achievement, and thereby serve as a valuable instructional tool (O'Shea, Note 7).

This shift from instructional symbolism to instructional technology can be aptly illustrated by Bloom's (Note 8) description of mastery learning in which he describes the following implications mastery learning has for

instructional practice: available time versus time-on-task (amount of time invested differs from the active learning time spent); intelligence versus cognitive entry (predicting academic achievement on the basis of intelligence measures differs from using specific knowledge, abilities or skills as prerequisites for learning); summative versus formative testing (using tests to judge a student's grade versus using tests as a diagnostic and instructional tool); teachers versus teaching (judging teacher quality on the basis of traits and training versus judging teacher effectiveness by examining instructional behaviors); parent status versus home environment conditions (estimating pupil success by noting home and family racial, socio-economic and cultural characteristics versus observing parent and pupil interactions and behavior in the home).

To be sure, a fully developed technology of teaching does not yet exist. Both Bloom (1980) and Stallings (1980) remind us that much additional research and developmental work remains to be completed. Moreover, Denham (1980) and Fenstermacher (1980) warn us about moving too quickly from the BTES findings to an overly definitive and rule-bound instructional system for all teachers. These are important caveats and caution is well advised, but I would disagree with those who would insist that the most that can be made of these findings is to develop materials for teacher workshops or for teacher use as their felt needs, discretion, or interests lead them to it.

Given the two significant changes in the schools' systems that were described above--the decline in the public's satisfaction with and support of the public schools, and the emergence of a technical instructional core--serious efforts to improve teacher performance calls for, I believe, an organizational response by the total school system. If there can be general agreement that some teacher behaviors and methods will more than likely

result in greater pupil growth than will other teacher behaviors and methods, then school districts must begin to identify those behaviors and attend closely to whether or not they are being used by teachers. School districts must identify instruction and pupil achievement as a major technical responsibility. In other words, school districts should begin the task of tightly coupling their organizational structure to an agreed-upon technical instructional core. This means that they must abandon the approach of offering "cafeteria style" inservice training and instead develop ways to assure that the agreed-upon instructional practices are utilized. They must re-examine the attitude that improving teacher performance is solely the responsibility of the classroom teacher. The entire school district, teachers and administrators, should begin exploring ways to link their organizational structure to the instructional core. To continue to ignore this crucial activity will, in my opinion, result in a further decline in pupil achievement and a continuing erosion of the public's confidence in the schools.

School Districts as Technical Organizations

How would a school district as a technical organization differ from school districts that are institutionalized organizations? Essentially it would mean that it would no longer leave specific teacher classroom behavior and the measurement of its effects solely to teacher discretion, behind the classroom door. The school district would likely provide inservice training on desired teacher behaviors, and they would see to it that teachers actually behaved in the desired manner, and they would determine whether or not the desired behavior was having its intended effect.

Let me illustrate this more specifically. A colleague of mine, Adrianne Bank, and I are conducting a three-year research study at UCLA's Center for

the Study of Evaluation on how school districts can link testing and evaluation with instructional improvement (Williams & Bank, in press). Based on our observations and analyses, we believe that some components of a technically based school district instructional program would have certain components. I will not attempt to present some blueprint that would be common for all school districts; we have learned that there are many ways in which school districts differ on conditions or variables that can critically influence the design and effective implementation of such a plan. No common program will work everywhere.

An important, perhaps the most critical, component is a comprehensive idea of what the district wishes to accomplish. What, for instance, is the overall logic of the plan? What parts of an instructional renewal plan does the district want to emphasize? Are there common teacher behaviors or conditions the district wants to see occurring in each classroom? What district conditions, specifically and generally related to schooling, impede or help the district? For example, it makes a difference in terms of inservice training needs if the district is already staffed with a large percent of competent, experienced teachers rather than a large cadre of new, inexperienced teachers. Additionally, teachers traditionally work alone behind closed doors; they do not readily embrace new teaching technologies into their repertoires. How will you bridge this barrier in attempting to change deeply embedded teacher behavior?

A district must determine its unit of change; by this I mean, where it focuses its attention--at the school building, the district level, or some combination thereof. In the past many have argued that the most effective change strategies should be built around the school site, with the principal playing a key change-agent role. In some instances, this would be most

appropriate. In spite of the widespread support for this strategy, however, I have increasing reservations about its use as the only way to change and improve teacher behavior. I believe our faith in principals' ability to change teacher behavior is sometimes overestimated. One reason for my reservation is that experienced teachers generally have little faith in the ability of a non-teaching principal, who often has less training and classroom experience than some teachers, to offer valid advice. Also, there simply hasn't been a technical core with agreed-upon techniques and vocabulary to which principals could turn when trying to change teacher behavior.

With regard to differing strategies, some school districts may agree at the district-wide level about an agreed-upon set of preferred teacher techniques and behaviors. In such districts the principal's task may be to assure that these standards and behaviors are being exhibited by teachers. But note that this would shift the principal's role from that of an expert who can determine teacher effectiveness to that of being an agent who assures the implementation of district-wide standards that have been agreed upon by teachers and administrators. In other districts, it may be more appropriate to consider the school as a unit, with the principal playing a major instructional role.

Another critical factor would seem to be the district's determination to enforce its instructional renewal plan. That is, some mechanism must be developed to assure that the district's agreed-upon standards are indeed being implemented. Specific steps must be taken to tightly couple the organizational structure to the technical core. Someone has to supervise the supervisor!

A consequence of this is that districts will eventually have to take appropriate action to assure adequate compliance or provide incentives to encourage those who must meet district standards and to assist those who cannot. An admittedly difficult problem is determining appropriate steps to be taken with those who cannot or will not show adequate improvement. Typically, district-teacher contracts and traditions have all but eliminated the termination of contracts of incompetent teachers. And to be sure it will likely be a long time, if ever, before a sufficiently developed technical core will be available that could be used for determining teacher competency. If the link between teacher behavior and student achievement can be firmly established, however, it seems reasonable that all parties to the educational enterprise--administrators, unions, parents and the courts--will want to seek a fair and reasonable way to assure that such behaviors are encouraged.

A final component would be that the districts would develop a set of criterion-referenced tests that would be available to the teachers for diagnostic teaching purposes. These tests should be in a highly usable form, e.g., easily administered, quickly scored, and directly tied to the district's instructional program. The link between test results and their instructional implications should be developed so that teachers can make use of the results rather than have the results used against them (O'Shea, Note 7).

There are numerous other components and conditions that likely must be attended to. Let me dwell on just one more, and a crucial one, namely the scope of responsibility. I do not view the development and implementation of a technical core to be solely a top-down, management responsibility; it is a school district responsibility. School administrators are no more qualified nor motivated to improve instruction than are teachers or teacher unions.

This effort must be a district-wide responsibility, with all the parties participating in the program's planning and implementation. Likely management, with its wider organizational perspective and responsibilities, will initiate such a plan. But such a plan will not go very far if it is essentially top-down and ultimately develops into an adversary relationship between management and labor that excludes the public. Developing and utilizing an effective technical core is everyone's business and in everyone's interest.

I have not talked directly about inservice training, but it is obviously a key to this approach because improvement will have to take place largely with experienced teachers. Inservice training would have to be geared to the special needs of each district and would include such activities as developing the technical core, teaching appropriate skills, developing and implementing a criterion-referenced testing program, and determining the implications of criterion-referenced test results for instructional practice. A key factor is that inservice training be linked to a district plan rather than a set of management-determined, symbolic activities which may have only a marginal relationship to what will most improve teacher behavior and pupil learning.

Is It Possible?

Perhaps some of you are thinking, "Well, these are interesting theoretical notions, but it is quite unrealistic to think that this can ever be put into practice." To this I would reply that two of the six districts that Adrianne Bank and I are studying have been developing and implementing plans like those described for years. (Also see Stow, 1979.) One is a large urban district, the other a small suburban district. While following somewhat different paths to get to their present positions, both have defined

a technical core, provided for the wide-spread understanding of the teacher behaviors that are expected, provided necessary inservice training for teachers and supervisors, provided for direct supervision (tight coupling), and related their efforts to competency-based pupil achievement measures. Far more than most districts, they have the qualities of a technical system--their technical core is tightly coupled with the organizational structure. It has taken approximately eight years for the districts to reach this point. There is still much work to be done; however, the districts already are convinced that this approach has resulted in increased pupil achievement.

Let me conclude with some speculations about ways in which this shift from an institutionalized system to a technical system might occur in districts. Several things might cause it to happen. One, some "idea champion" or cohort of reformers may recognize the opportunity and push in this direction simply as a way of improving the educational system. In one of the districts we studied, this was the way it happened. The other way it may come about is when districts are so persistently unsuccessful in improving pupil achievement that they begin to lose public support and their very existence is threatened. They may turn to such a strategy as a crisis solution.

If a teaching technical core is emerging and its use in classrooms is determined to have an important impact on pupil achievement, then we cannot wait for a full-blown technology to develop before we act. We should seriously consider taking what is available and still developing and fashioning a technical core, however limited, and implementing it in school districts in a fair and humane way. I maintain this will only happen effectively when changing teacher behavior is acted upon as a school district responsibility.

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An Expanded View of the Student Outcomes That Are Built or Restrained by Teaching Processes and Structures*

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There is no question that a primary goal of teacher education--whether preservice initiation to the concepts, processes, and decision-making of teaching or inservice refinement and improvement of these factors--is to produce teaching and instruction that make it possible for all students to learn. Likewise, the importance of students' acquisition of basic mathematics, reading, and writing skills is not questioned. Nor is their acquisition of the skills and attitudes necessary to become employable adults a matter of conjecture. Thus, in terms of research on teaching and teacher education, the questions regarding criterion measures of teacher effectiveness lie not in these general goal areas, but in two underlying characteristics of these and other such general goals.

The first, problematic characteristics of general educational goals is that no single year's experience at the elementary school level or no single course at the secondary level produces the desired outcomes. For any given individual, achievement of skills and attitudes results from a collection of many educational experiences over an extended period of time. (In fact, in the United States, we typically expect the complete learning process to

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require 13 years of schooling, kindergarten through twelfth grade.) This makes it difficult to attribute a student's acquisition of knowledge, skills, attitudes, etc., to a particular teacher or a particular year of schooling.

The second problematic characteristic of general educational goals is that the knowledge, skills, and attitudes which they encompass are learned both in and out of school. Thus, as noted by Hamilton (1980), "simply assessing student achievement and attributing that achievement to school practice is foolish" (p. 2). Further, as Jencks, Smith, Acland, Bane, Cohen, Gintis, Heyns, and Michelson (1972) and others have pointed out family background and other factors, including "luck and chance," are as good or better predictors than schooling data when one wishes to predict a student's eventual occupational attainment and success.

What, then, can be used as measures of teacher effectiveness? Building on the work of Hamilton (1980) and numerous economists, I propose that what we have been using and must continue to use are indicators that the teaching process will ultimately lead to students' attainment of the general goals to which we all subscribe. Further, I recommend that we utilize these indicators in the same manner they are used in economics, that is, as "leading indicators." To do this requires that we identify that set of "indicators" which, if they occur in the short-term in a classroom and accumulate over several years of schooling, predict that all children will have successful schooling experiences (attain the general goals).

Further, I suggest that inasmuch as we are focusing on teaching, whatever indicators are used must (a) be affected by what a teacher does or does not do, (b) be observable (measureable) within a relatively short period of time in the actual teaching situation, (c) have a logical/theoretical link with students' acquisition of the general educational goals, and

(d) accommodate individual differences among teachers and students. For discussion purposes, in no order of priority, I propose the following as indicators of teaching effectiveness that meet these five criteria:

- Agreement between teacher intent and student understanding of what is to be learned/accomplished/produced
- Congruence between schooling goals and the student participation requirements of the classroom
- Use of time in the classroom
- Students' views of themselves and others

Prior to discussing each of these indicators, several features of schooling warrant consideration because they influence the boundaries within which the indicators with be observable. First, as noted by Jackson (1968), the teaching and learning that occur in schools take place in a group setting. Seldom, if ever, is one teacher assigned only one student. To work in such a configuration requires special arrangements that make it possible for numerous people to exist and work together. Second, in a typical classroom, teacher and student talk is an integral feature of the teaching-learning process. Third, schools are basically evaluative settings. What a student does there and what others think of what he or she does are important. Fourth, generally schools are designed so the teacher is more powerful than students in terms of deciding what will occur in the classroom. Fifth, student achievement in schools is a mutual responsibility of the student, the teacher, other members of the school organization such as school administrators, and parents. No single person can be held accountable for a student's achievement of the general goals of education.

Thus, indicators of effective teaching occur in a complex context that brings with it many givens as well as many manipulables. As each of the

suggested indicators is discussed, the aspects of the schooling setting listed above should be kept in mind.

Agreement Between Teacher Intent and Student's Understanding of What Is to Be Done

Use of agreement between teacher intent and students' understanding of what is to be done as an indicator of effective teaching is based on two assumptions:

(1) For at least part of the time during a school day, the teaching acts in a classroom are intentional. That is, the teacher plans to teach particular skills or knowledge to particular students and purposefully selects the materials to be used, the teaching behaviors to employ, and the ways in which students will demonstrate acquisition of the skills or knowledge.

(2) Students must understand and interpret both what is taught and what they are to do to demonstrate skill and knowledge acquisition in order to be successful learners. Hence, students' understandings of the teacher's intent mediates the relationship between observed instructional activities and the student's participation behavior in the classroom.

Successful teaching, then, might be expected to result in high agreement between the teacher's intended outcomes and a vast majority of the students' interpretations of what was to be done. In adddition, behavior in the classroom and the outcomes of their work would be in accord with teacher intent.

To date, this type of indicator of successful teaching has been included in only a few research efforts. For purposes of illustration, I will provide examples from work that currently is underway at Far West Laboratory.

At Far West Laboratory we have been studying the classroom from multiple perspectives, one of which focuses on the teacher intent-student understanding linkage. The primary data source used to obtain information regarding teachers' and students' internal thinking in this regard has been open-ended interviews. Teacher interviews emphasized what the teacher intended to teach during a given lesson, why this was being taught, how it would be taught, what the students were to do, what outcomes the students were to demonstrate or produce, and how student performance would be evaluated. Student interviews were conducted immediately following the actual conduct of the lesson described by the teacher. With few exceptions, most of the interviews focused on soliciting each student's understanding of the ongoing activities, e.g., asking the student about what he/she was supposed to do, what made a good assignment, and how the teacher would evaluate the work. In addition, in-class observations of the teacher and student were conducted while the actual lesson took place.

Three findings from the study (see Mitman, Mergendoller, Ward, Tikunoff, & Rounds, Note 1, for complete information) illustrate the potential usefulness of the teacher intent-student understanding indicator.

First, it was generally the case that students at the earliest grade levels (e.g., kindergarten and first grade) had difficulty communicating their perceptions, while students at later grade levels had little or no difficulty. By second grade, some students were able to describe the requirements of their assignments in fairly articulate terms. Hence, student

perceptions appear to be a potentially reliable source of indicator data early on in the schooling process.

A second finding was that there was variation within some classes in terms of how aware students were of the requirements of the assignment and their own behavior. The existence of such differences was consistent with the differences in student participation that were observed. These differences suggest that students' understanding of what is to be learned and done probably is one mediating factor between work characteristics and participation. There were other classes where understandings of the assignment were similarly clear or confused across all students who were observed and interviewed. In these cases, the teacher's manner of setting up the instructional activities may have been influential enough so as to have elicited very similar responses from students. There was evidence that the work activity structures and instructional and managerial behaviors of the teachers in the classes where student participation was more competent led to a good mesh between teachers' and students' understanding. The teachers in the classes with the most competent student participation had more specific instructional plans that they were able to communicate to students. More articulate lesson instructions and a more tightly supervised instructional environment seemed to give all students a clear understanding of the expectations for the work performance and class behavior. In contrast, in classes where students' participation was less competent, teachers seemed less sure of their instructional tactics. Many students, in turn, evidenced more ambiguity about what was required and sometimes even misinterpreted requirements. In short, their understanding of the work activity structure and demands was poorer.

A third finding indicated by the Far West Laboratory student interviews was that, in general, students were less able to comment on some aspects of their assignments than others. For instance, students usually had little difficulty in describing what they did or were supposed to be doing on their assignments during class time. In contrast, students seemed to have more difficulty in describing the purpose of their assignments or what the teacher would do with their papers once they were turned in. These latter inquiries apparently called for more abstraction than many students were capable of, even at the higher grade levels, or required the use of teacher intent information that had not been given to the students. This suggests yet another important aspect of teacher-student communication that could be tapped by the "understanding indicator." One would expect that more successful teachers would make the purpose as well as the procedures of the teaching-learning activity clear to all the participants.

In his discussion of the tasks of teaching and learning in classrooms, Doyle (Note 2) outlined several aspects of teaching and learning that, in my opinion, also fall within the parameters of this teacher intent-student understanding indicator.

Doyle's approach emphasized learning tasks and what he termed "an exchange of performance for grades." In this context, grades referred to "the various forms of summative evaluation or public recognition for appropriate performance, that occur in classrooms" (p. 15). He noted that learning tasks differ according to the probability and efficiency of task accomplishment and indicated that these differences were experienced by the students as degrees of risk and ambiguity. According to Doyle:

> Risk refers to the likelihood of not being able to meet the task demands on a particular occasion,

> either because the demands are great or the student will be unable to acquire the competence necessary to display the required performance. Ambiguity results from gaps in information about the exact performance that will be required and how to produce it. The concern here is not ambiguity resulting from a lack of teacher clarity. Some tasks are inherently ambiguous. For example, writing is a task that is often ambiguous because public criteria for "good" writing are difficult to define and, in McPherson's (1977) words, "there can be no absolute formula for producing it" (Note 2, p. 18).

Doyle went on to suggest that although teachers may present, or assign, tasks that involve high risk and high ambiguity, students will attempt to negotiate less demanding work, find ways to get someone else to do the work (e.g., the teacher), or circumvent the task. Here, then, we are not only looking at teacher intent-student understanding but also student manipulation of intent, perhaps based on their understanding of the original task. When this occurs, more successful teachers may pursue their original intent and be less manipulable than less successful teachers and students in the more successful classes, in turn, may devote less time to manipulation efforts than students in other classes. Further, more of the learning products (outcomes) in the successful classes should incorporate and demonstrate the complex knowledge and skills the teacher intended to have the students apply and learn.

Thus, even though research related to teacher intent-student understanding is recent and limited, viewed from a variety of perspectives, this construct appears to offer a teaching effectiveness indicator that meets

the four criteria listed earlier and can be measured based on the current state of the art in teaching research.

Congruence Between Schooling Goals and Student Participation Requirements in the Classroom

This second indicator also incorporates aspects of classroom-based teaching and learning that have only recently been investigated. It, likewise, builds from two assumptions. First, it is assumed that in addition to reading, mathematics, and writing skills achievement, parents, teachers, etc. also ascribe to other schooling outcomes for students. For example, most schools and boards of education include somewhere in their list of general educational goals development of independent learning skills and development of ability to work cooperatively and collaboratively with others.

Second, it is assumed that how students learn has as much or more to do with acquisition of these latter types of skills and knowledge than the content of the learning task (e.g., see Bidwell, 1972, and Dreeban, 1967). Bossert (1979) supports this view:

> What students are exposed to should affect what they learn. Yet the structure and methods used to transmit the content of the curriculum and to facilitate the development of required skills also are important determinants of learning. (p. 13)

If one accepts these assumptions, the structure of the classroom and the student participation requirements imposed by the structure can be employed as short-term indicators that long-term achievement of goals such as development of independent learning skills and cooperative group behavior will occur. For example, in order to become an independent learner, one

might expect that a student would need to learn to choose a topic to study. To acquire group cooperation and collaboration skills, one might expect that students would need to produce some group products as part of their classroom assignments.

Bossert (1979) identified several aspects of the classroom structure that provide a means for determining whether the participation requirements of the structure are congruent with goals such as independent learning and cooperative behavior. Two elements of the classroom activity structure, in particular, seem to be related to development of independent learning skills. One is the kind and amount of control students are given over their learning tasks, which can vary from deciding which of several assigned problems or questions to answer first, a minimal control option, to designing and carrying out an entire learning task. The second is the extent to which students may advance to new learning activities without teacher approval. A Far West Laboratory study of all the classrooms in a single elementary school (Mitman, et al., Note 1) found that student control was more restricted in the lower grades than the upper grades. By grade four, two types of student control options were prevalent. The first kind of option entailed control over the content of the assignment. For instance, if students were asked to write a journal entry, story, or essay, they had control over the content because they could create the content or choose the content topic from a specified set of alternatives. The second kind of option entailed control over the pacing of the assignment. In other words, students often were given control over the amount of in-class time they devoted to an assignment. The amount of time could vary from student to student both because some students could complete an assignment more quickly than other students, and

because some assignments were to be completed over an extended time period (several days or weeks), thus giving students control over what portion to complete during a given day.

In terms of advancement, students could advance within an assignment, without required approval from the teacher, for approximately half of the activities that were observed. For the remaining half of the activities, students were dependent on the teacher to advance, usually because the teacher was leading the lesson and taking students step-by-step through the lesson material.

While being able to advance within an assignment without depending on the teacher was fairly common, being able to advance to a new activity without teacher approval was not. The option to advance across different activities without teacher approval was present only in the classes of Teachers S (second grade), R (fourth grade), and Q (fifth grade), and even then, this option did not necessarily apply to all students in all the class activities.

Thus, in this school, progress toward acquisition and use of some of the skills associated with becoming an independent learner appeared to be taking place. The activity structures that were established by the teachers required students to assume more control over their learning tasks as they moved through the elementary school experience. On the other hand, the structures did not appear to require an increase in student responsibility for advancement to new learning tasks. Hence, this indicator raises some doubts about long-term achievement of the independent learning goal.

Relative to cooperative behavior, the element of the activity structure that is important is division of labor. Division of labor is concerned with

the extent to which the activity structure requires students to work together to complete an assigned task. Typically, division of labor occurs when a group of students is asked to produce a mural, a play, or a product with multiple components, and different students are assigned different tasks related to the completion of the assignment. The success of the work is based on the compilation of all students' contributions.

With few exceptions, there are no formal divisions of labor among students for the activities observed in the classroom in the Far West study. In other words, the vast majority of activities did not require that students work together in pairs or small groups to complete joint products. Yet, while formal division of labor was not the norm, informal collaboration among students was. Teachers encouraged their students to seek assistance from one another in completing their individual products, sometimes emphasizing that students should take their inquiries to each other before approaching them (the teachers). Support of informal collaboration among students--"using each other as resources"--seemed to be a common philosophical thread uniting all the teachers. However, the observations indicated that permission to interact so freely may have blurred students' understanding of the task, and, in turn, produced less competent participation, per se. Thus, if the teachers wanted to foster short-term cooperative behavior that was congruent with eventual achievement of their long-range goal in this area, it appeared that they should have established a formal, explicit structure that required such behavior. The findings further suggested that the teachers should specify who is to work together, who is to do what part, and what exactly is to be accomplished. Until students have extensive experience with cooperative learning activities, such guidelines are necessary for the desired participation to occur.

In summary, the student participation requirements established by the activity structure the teacher creates and the extent to which students participate successfully within the structure can be analyzed and utilized as an indicator of teaching effectiveness. These findings then can be compared with long-term learning goals. When the structure requires students to participate in ways that are congruent with acquisition of the long-term goals, and students do so successfully, the teaching may be judged successful from this perspective.

Use of Time

According to research on teaching, one of the most critical variables in classroom teaching and learning is time. The amount of time available for classroom teaching and learning, the amount of time and how students are engaged in instructional tasks, the amount and quality of time allocated by teachers to various activities are among some of the questions being asked. For as Jackson (1968) has noted:

> The amount of time children spend in school can be described with a fair amount of quantitative precision, although the psychological significance of the numbers involved is another matter entirely. In most states the school year legally comprises 180 days. A full session on each of those days usually lasts about 6 hours (with a break for lunch), beginning somewhere around nine o'clock in the morning and ending about three o'clock in the afternoon. Thus, if a student never misses a day during the year, he spends a little more than 1,000 hours under the care and tutelage of

> teachers. If he has attended kindergarten and was reasonably regular in his attendance during the grades, he will have logged a little more than 7,000 classroom hours by the time he is ready for junior high school. The magnitude of 7,000 hours spread over six or seven years of a child's life is difficult to comprehend.

Of course, given this total amount of time across the years, the actual amount devoted to learning depends on a number of factors. Fiske (1977) suggests that among these are the length of the school year, the length of the school day, how teachers allocate time, and the efficiency of its use by students. Thus, it would seem that use of time can be used as an indicator of teaching effectiveness.

Indeed, where time has been investigated, it has been found to be a significant variable. For instance, both the amount of time in school and the amount of time in specific instructional settings has been found to relate positively with student learning outcomes in a number of studies. Wiley and Harnischfeger (1974) reported a positive relationship between achievement and length of school day and absentee rate. Karweit (1976) applied the Wiley-Harnischfeger analysis model to several other sets of data, and while the effects were not as great, nevertheless she argued that the quality of time use was as important as the quantity. McDonald (Note 3), Hess and Takanishi (Note 4), Stallings and Kaskowitz (Note 5), and Carroll and Spearett (Note 6) investigated amount of time spent in instruction in specific subject areas and found positive relationships between increased time and learning outcomes.

While these studies were promising, the definition and measurement of instructional time generally has been at a gross level, e.g., total minutes spent. Two exceptions would be the McDonald (Note 3) study in which various patterns of time use and amount of time in direct instruction by the teacher were investigated; and Fisher (Note 7) study, which looked at teacher allocation of time to content categories of second grade mathematics instruction and the relationship of subsequent instructional time in each to student achievement. Danoff (Note 8) attempted to provide quantitative findings on the relationships between the factors such as average number of teacher hours per student per week and Language Minority Students' achievement. It is only when the study of time moves to these more specific levels that the findings become useful guides for identifying quality teaching and the maximal opportunity to learn.

Specificity may be derived by considering several variables within the time dimension. Study of the allocation of instructional time is a first step toward delimiting the time factor. For example, Rist (1970) looked at the amount of instructional time devoted by the teacher to various types of students within specific subject areas. Brophy (Note 9) investigated the amount of instruction based on teachers' expectations that students were high or low achievers. In both these studies significant differences in time allocation and learning outcomes were found for different types of students.

Further, inasmuch as it is known that:

- time is allocated differently across schools and classrooms, and that for the most part, the legally prescribed length of the school day defines the amount of time available for use by a teacher and for a student;

- in some classrooms teachers spend more time on instructionally oriented tasks than do teachers in other classrooms;
- a teacher may spend more time instructing one group of students than another
- within a particular subject area, some students may receive more instructional time than others (i.e., spend more time actively engaged with the teacher in completing academic tasks); and
- manipulation of time appears to be related to the student consequences that result from participation in a classroom teaching/learning group;

it seems imperative that whatever measures are employed, they should look at time from both the teacher and student perspective.

One definition of time use that, in my opinion, incorporates concern for both teacher and students actions and is observable and measurable in the classroom is academic learning time. Academic Learning Time (ALT), as developed by Fisher, Filby, Marliave, Cahen, Dishaw, Moore, and Berliner (Note 10) is defined as the time a student spends in a particular content area, engaged in learning tasks with a high degree of accuracy.* The basic components of ALT, then, are allocated time, student engagement, and student accuracy rate. The definition requires that three conditions must exist simultaneously before a student can accumulate ALT. First, <u>time</u> during

*In previous writing about ALT, accuracy rate was referred to as success rate. Since the term "success" has a broader meaning than its technical use in the definition of ALT and since use of success might be confusing in discussions of ALT and successful schooling practices, the term accuracy will be used in connection with ALT.

instruction is allocated to the content area of interest (say, mathematics). Second, the student is engaged in a learning task. Third, the learning task is chosen so that the students' responses are correct or accurate most of the time. Research shows that the more ALT accumulated by a student during instruction, the more the student is learning.

Previous research suggests that differences in ALT may be expected to occur across classrooms and for different students. For example, Powell and Dishaw (1980) reported that allocated time for second graders ranged from 62 to 123 minutes per day, for fifth graders from 49 to 105 minutes per day. Engaged time was from 38 to 98 minutes for second graders and 49 to 105 minutes for fifth graders. Evertson (Note 11) in a study at the junior high level, found that low ability students were engaged 40 percent of the time in academic activities, while high ability students were engaged in academic activities 85 percent of the time in class.

Academic Learning Time, then, is recommended as a short-term indicator of teaching effectiveness that appears to have clear and interpretable consequences for students. It also is manipulable by the teacher and related logically and empirically to students' long-term acquisition of the general educational goals.

Students' Accomplishments

The most commonly used measure of student accomplishments in the study of teaching has been students' scores on standardized achievement tests. The inadequacies of these tests have been discussed on numerous occasions (for example, see McClelland, 1973). Hamilton (1980) summarized these concerns in a succinct and poignant statement:

> It is simply not adequate to treat reading scores as the outcome of schooling because

> schools teach far more than how to take reading tests. Even more importantly, the ability to use written language effectively in the world outside the school, which is after all, the ultimate concern, depends heavily on factors other than reading scores. To be effective participants in the U.S. culture, students need to know not only how to respond to the kinds of questions posed in reading tests, but also where to find written information, how to weigh conflicting information, how to transfer knowledge gained from reading into specific situations and how to think and act upon it in new contexts. Moreover, they need to be sufficiently motivated to make use of all other abilities. There is no basis for claiming success for schooling practices that result in high test scores and simultaneously destroy students' motivation to read. (p. 2)

Nonetheless, so long as standardized achievement tests are given to students at various intervals during their schooling experience, students' scores on such tests will serve as <u>one</u> indicator of schooling, and thus teaching, success. Further, such data have been used in several of the major process-product studies of teaching, e.g., Brophy (Note 9); Soar and Soar (Note 12); and Brophy and Evertson (1976). The key points to remember are (a) such scores serve as only one indicator that students are progressing toward accomplishement of the ultimate goals of schooling, and (b) the

usefulness of the scores as predictors of a given teacher's long-term effectiveness as a teacher are as questionable as any other indicator (for example, see Jencks, et al., 1972, and Brophy & Evertson, 1976).

Given the above concerns regarding standardized achievement tests, consideration is warranted of additional ways to measure/observe students' accomplishments as an indicator of teacher effectiveness. The several examples that follow by no means exhaust the range of possible approaches that could be generated in collaboration with teachers, parents, and students. They are presented as representative samples of some of the directions such an endeavor might take.

A criterion-referenced test is one alternative student accomplishment measure. Such tests were used in the Beginning Teacher Evaluation Study (see Fisher, et al., Note 10; Tikunoff, Berliner, & Risk, Note 13). In addition, teachers often utilize commercially prepared instructional units that include tests referenced to the unit content or they develop their own tests to accompany the assignments given as a part of the on-going, day-to-day instruction in their classes. In the short term, a student's performance on such tests is given high consideration by the teacher in judging that student's performance. This being the case, students' performance on criterion-referenced tests deserves attention as an indicator of teachers' as well as students' success.

As suggested above, scores on tests do not cover all the ways students may demonstrate their accomplishments. Many learning activities require students to produce products, reports, etc. that demonstrate various skills and knowledge. One way to approach the assessment of such accomplishments is through an evaluation of the products.

In a study of the effects of an independent learning system on student achievement and attitudes, Ward, Mortensen, Trinchero, Lash, Lai, Linn, Fisher, Stanton, and Cahen (Note 14) developed a paired-comparison method that illustrates how such an evaluation can be done. The evaluation utilized four product evaluation dimensions as follows:

1. Global Quality--Total characteristics of product, overall quality, quality as perceived on first impression, non-analytical judgment of quality, general aesthetic quality, general "goodness" or "badness."
2. Cognitive Quality--Level of intellectual activity apparent in product, accuracy of information contained in product, extent to which product required collection of information, discrimination between valid and invalid evidence, and reorganization and synthesis of information.
3. Originality--Divergence from what is normally expected, shows unique characteristics, experiments with different approaches, creativity, inventiveness.
4. Use of a Variety of Resources--Product displays evidence of the use of many resources either in research for product or in the preparation of the product, use of resources other than books, use of observation or interviews, use of different media in execution of the product, use of community stimuli in product, use of people.

The comparison involved selection of five "standard products" (see Guilford, 1954) and then pairing all other products with each of the standard products. Each product was rated on the above dimensions based on a nine-point scale by five independent judges. The detailed procedures used to

arrive at a final product score are presented in the study report. They are not presented here because how the accomplishments score was derived is not as significant to this discussion as the fact that it was possible to do so. Further, in the independent learning study, real differences were found between the global quality ratings of students' products based on what the teacher did in the class (level of implementation of the independent learning system). Students in the high implementation classes received significantly higher global quality ratings than those in other classes. Thus, an accomplishment measure of this sort appears to provide a useful short-term indicator of effectiveness in teaching student skill areas not tapped by achievement tests.

Yet another alternative short-term student accomplishment measure can be derived from the students' daily work. Here the accomplishment measure is individual student, as well as group or total class, performance relative to whatever was assigned by the teacher during a particular lesson. Aspects of the assigned tasks to be included in the score are length, complexity, and portion of correct responses at various complexity levels. While development of the required complexity measure presents a challenge in all instances, it is more readily accomplished for subject areas such as math, spelling, grammar, and word recognition in reading. Discussion lessons, regardless of subject, present a unique challenge because skills such as turn-taking and public speaking are involved (see Mehan, 1979) along with provision of correct responses. Nonetheless, some measure of daily work accomplishment also can serve as a short-term indicator of teacher effectiveness. Further, logically, one might expect an accumulation of successful daily work scores to lead to long-term achievement for students.

Students' Views of Themselves and Others

For the most part, this indicator category comprises measures that have traditionally been classified as the affective outcomes of schooling. While students' self-concepts and attitudes toward school are two measures that fall within this category, I have elected to devote the bulk of the discussion to other measures inasmuch as the field of research on teaching, as well as educational research in general, is well-versed in attitude and self-concept measures that can be used, their shortcomings, etc.

Three other aspects of students' views of themselves and others that show promise as indicator of teaching effectiveness are students' perceptions of differential treatment by the teacher; students' perceptions of how well they did in a lesson, why they did well, and how they knew this; and students' perceptions of the teacher.

Weinstein, Middlestadt, Brattesani, and Marshall (Note 15) have been conducting the forefront work regarding students' perceptions of differential teacher treatment. The teacher treatment behaviors they have investigated were taken from a review of the literature on the relationship between teaching behaviors and student achievement, on how teacher expectations are expressed in behavior, and on student perceptions of classroom environments. A teacher treatment inventory has been developed in which a student indicates whether the teacher "always," "often," "sometimes," or "never" does a particular thing with/to/for various hypothetical students, e.g., how frequently does the teacher ask a particular type of student a question during class discussions, respond when that student raises his or her hand for help.

Their findings from a study of fourth-grade students indicate that students perceived strong differences in the teacher's treatment of high and

low achievers regardless of the sex of the hypothetical students. They perceived little difference in treatment of boys and girls. Low achieving students were perceived as receiving more supportive help and more negative teacher feedback overall than high achieving students. Boys were perceived as receiving more work and rule orientation attention from the teacher than girls did. High achieving students were perceived as receiving higher teacher expectations and more opportunity and choice than low achievers.

Whether such findings would be considered positive or negative indicators of teacher effectiveness is a matter of judgment. Perhaps differential treatment is called for and accurate student perceptions would report that it occurred. On the other hand, some differential treatments may not be desirable. Regardless, student perceptions can serve as a short-term indicator of the impact and impression a given teacher's behavior is having on students.

Students' perceptions of how well they did in a lesson, why, and how they knew this are being investigated in the Significant Bilingual Instructional Features Study (see Tikunoff, et al., Note 13) currently underway, in a study conducted by the Ecological Perspectives of Successful Schooling Practices Program at Far West Laboratory (see Mitman, et al., Note 1) and in a study of students' transition to junior high school (see Mergendoller, Ward, Rounds, & Packer, Note 16). In the first two studies, student interviews conducted immediately following an observed lesson served as the data source. In the junior high study, an end-of-the-year interview was used. Findings from the Bilingual Study are just now being analyzed and, thus, are not reported here. In the Ecological study, at the earlier grade levels, the students indicated that the "goodness" of an assignment was determined by the teacher's reaction to the assignment. In other words, they

said that if a teacher gave a good grade or wrote favorable comments, then the assignment was good. By the fourth grade, some students seemed aware that there were more universal standards by which an assignment would be judged, e.g., that one had to present enough examples, spell correctly, and write clearly. By the fifth and sixth grades, most students referred to such standards, and a few students even implied that they had set their own internal standards regardless of those encouraged by the teacher. Thus, students at the higher grade levels were less reliant on external feedback and seemed able to make judgments about their own work by referring to a set of standards that they learned through accumulated experience.

Students at the junior high school level initially provided letter grades as the criteria by which their work would be judged, e.g., an "A," "B," etc., written on the paper by the teacher. With probing, approximately one-half of the students noted that what was required to do well varied with the circumstances of the class or the assignment. They talked about the influence of "how much effort was put into an assignment." They noted the difference in performance required to obtain a grade in an "easy" versus a "hard" class. The majority of the students interviewed said to get a good grade a student had "to finish the work and stay out of trouble." They said to learn "you have to listen hard, do the work, remember, get something into your brain."

Since students might be expected to develop different perceptions regarding how well they did, why, etc.--based on the types of performance reinforced by the teacher--analysis of these perceptions provides another way to look at teaching effectiveness.

Finally, students' perceptions of the teacher, as he or she carries out the teaching role, provide another view of teaching effectiveness. Excerpts

from the junior high school study describing the seventh grade teacher's classrooms (see Rounds, Mergendoller, Tikunoff, & Ward, Note 17) provide keen examples of how students of this age assess the degree to which the teacher is performing the teacher role. Since findings from the study indicate students refuse to cooperate with and often purposely confront and disrupt the class of a teacher who does not meet these student expectations, the relevance of such perceptions as an indicator of teacher effectiveness is supported. To illustrate, some exemplary study comments were:

About a teacher who was unable to control the students:

He's not even considered a teacher, sometimes, the way he acts.

When you go up to ask him some private questions about your work he'll just brush you off. He doesn't talk to individuals.

When you ask for help, he looks at your paper and tells you, you did it wrong. I knew I did it wrong. I wanted to know what I did wrong.

People do things like yelling and spitting. He just sits there. He doesn't do anything!

About a teacher whose students participated successfully in assigned work:	Like when he talks, he knows what he's talking about. He explains it real clear and, you know, makes it better for us to understand. He sees everything that is going on. You raise your hand he will come over and help you. He'll tell you what it means but he won't give you the answers.
About a teacher who had a reputation among the students for being strict:	I like the class. I work hard. She gives you confidence and makes you want to work. She don't mess around. She's hard but fair.

To a large extent, these comments reflect a perception of the teacher as a super-ordinate who takes into consideration the needs and development of the subordinate. Metz (1978) examined this theme in regard to the exercise of legitimate authority and proto authority. She pointed out that teachers, because of their institutional status, could attempt to coerce students into behaving as the teacher desired. However, at the junior high school level, such an exercise of proto authority was resented and resisted by the students. Further, work in the Ecological Perspectives elementary school

study (Mergendoller, et al., Note 16) indicates students' perceptions of the teacher and authority change as they grow older. One indicator of teacher effectiveness, then, may be the extent to which the teacher takes into consideration the needs, preferences, opinions, and feelings of students as developing individuals and adjusts enactment of the teaching role to capitalize upon the students' developing perceptions of the role of the teacher.

Conclusions

The five potential "leading indicators" of teaching effectiveness that have been discussed were taken from a variety of studies of teaching. In conclusion, it is important to emphasize that the research from which the indicators were extracted and the ways in which they should be applied does not follow a single approach to the study of teaching. Although the terms "indicator" and "predictor" that appeared early on in this paper most often have been used in reference to process-product research outcomes, they need not be limited to this research approach. Doyle (undated) discussed three research paradigms that, in his view, were applicable to the kinds of problems and questions asked in teacher effectiveness research. The process-product paradigm is only one of these. He also presented two alternative paradigms, "a mediating process paradigm derived primarily from applied verbal learning research, and the classroom ecology paradigm, constructed from naturalistic studies of school life" (p. 4). Variations on some of the above indicators may be investigated more readily using one of these latter paradigms.

Regardless of what approach is taken, a warning given by Hamilton (1980) needs to be uppermost in the minds of anyone who is seeking to define and apply indicators of effective teaching:

> We need to be able to talk about what happens "as a result of" a particular educational experience, but we cannot allow the limitations of language to obscure the fact that teaching and learning are interdependent processes that are related in multiple reciprocal ways. "Outcomes," therefore, are only separable from the learning context as a whole for convenience. What is an outcome for one purpose is a process for another. This entails that outcomes can only be understood in context and not as independent phenomena. (p. 1-2)

Finally, the importance of teacher input and analysis in the development of teaching effectiveness indicators must be noted. Many of the indicators proposed here require information and insights only the teacher can provide, partly because of the emphasis upon short-term measures and partly because of the long-term impact of the teacher's decisions, actions, and expectations upon student performance, per se. There is no point in applying an irrelevant teaching effectiveness indicator when a discussion with the teacher will identify a measure that relates to what is to be taught and learned in both the near and long term.

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Recommendations for Study on Changing Teacher Practice

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A particular concern of the RITE staff has been to involve experts in considering alternative directions that our research could take. For this reason 13 highly qualified, enthusiastic persons (see Appendix), representing a variety of geographic areas and professional backgrounds and roles in education, were invited to meet with the RITE staff in a two-day working conference to consider issues involved in staff development of in-service teachers. At the close of the conference, these 13 participants responded individually to the following statements and questions.

> In conceptualizing and designing our research project on staff development we would like to make maximum use of your knowledge and experience in this area. For that reason we have set aside this time for you to write ideas and suggestions which you are willing to share with us in our study. The following questions are meant to direct your thinking toward areas of concern to us, but not intended to limit your comments. Please include other issues and areas which you feel would be important to take into account as we develop the study.

1. What <u>content</u> derived from what is known about teaching should the RITE research effort on staff development include?
2. What <u>behaviors</u> derived from what is known about guiding change should the RITE staff development effort promote for staff developers?
3. What <u>effects</u> of the staff developers' behaviors should be hypothesized for teachers?

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4. What effects of the teachers' behaviors should be hypothesized for students?

5. What institutional variables should be given attention in the study and how should the selected variable be attended?

6. What procedures should be used in the study?

This report is a summary of participants' responses to the above questions including any additional comments which they made. Participants were not asked to sign their response sheets so it is not possible to cite individuals for their ideas and suggestions.

Content for Inclusion

The RITE staff wanted conference participants to formulate two broad classes of recommendations to inform its research efforts: first, which of the findings from research on teaching were most amenable to translation into staff development activities; and second, how that translation might occur so as to be most useful in facilitating desired change in teacher behaviors.

Consideration of conceptual work directed toward classroom structures--tasks and activities--was suggested as essential for staff development since management skills were regarded as necessary for effective teaching to take place. Participants recommended inclusion of what has been learned regarding effective methods of classroom organization and management of student behavior. Suggestions were made to use findings regarding time on task, mastery learning and checking for student understanding. Four participants mentioned the work of the developmentalists, emphasizing the importance of understanding the conceptual framework within which the teacher operates, the concrete-abstract continuum, the developmental "matching" of students with teachers and curriculum, and the process by which students develop. In

addition, it was suggested that some consideration should be given to the question of long term versus short term cognitive gains.

Recommended content included what is known regarding information processing, learning preferences, perception, teaching in non-formal settings, imitative learning and cultural differences in a classroom. Process-product study data, work involving congruence between goals and student participation, and findings from the area of the change process were also mentioned. The RITE staff was encouraged to be alert to new information as it becomes available and to maintain a flexibility that will allow for its inclusion as the present study progresses. Finally, there was a warning against the use of a laundry list of individual variables in forming a content base for thinking about research on teaching, and a suggestion that "craft" knowledge gained from "outstanding" teachers be included.

Behavior Desired in Staff Developers

In responding to the question regarding behaviors to be promoted in persons responsible for staff development, participants listed personal characteristics: acceptance, supportiveness, high energy, enthusiasm, faith in people, proactiveness, flexibility, genuine concern, and the ability to accommodate for change and conflict. However, observable behaviors which could be used as indices of these characteristics were not included. One person suggested that a staff developer should know what behaviors the teachers should exhibit and should demand high standards of performance of those behaviors but, at the same time, should function as a confidant and source of personal support for the teacher. Another suggestion was that the staff developers should involve teachers at every step of the change process, building on previous staff development activities of the teachers, and modeling behaviors which they desire teachers to exhibit.

It was recommended that staff developers should demonstrate inquiry skills--ways to describe, analyze, evaluate and redesign activities--and should help teachers to become more analytical, to develop support systems, and to use the human resources available to them for problem solving. A clinical small-group mode was recommended in which the staff developer and the teachers would collect and analyze data and design activities accordingly. Participants indicated that staff developers should know how to focus on process as well as product, should understand the processes involved in adult learning or development, and should be able to identify and respond to teachers' concerns. One participant pointed out that teachers have been found to use recommended practices selectively according to the practicality of the recommendations, i.e., the extent to which they are procedurally clear, congruent with the teachers' situation and task demands, and inexpersive to adopt.

Effects for Teachers and Students

It is assumed, for purposes of the study, that the efforts of the staff developers will affect the behavior of teachers, which will, in turn, affect the behavior of students. When participants were asked to suggest desired outcomes of this change effect in terms of teacher and student behavior, the responses included mention of both specific observable behaviors and attitudinal and emotional states.

Specific outcomes suggested for teachers included: 1) fewer discipline referrals, 2) an increased repertoire of classroom management skills, 3) knowledge of data collection procedures, 4) more time devoted directly to teaching, 5) greater variety in teaching activities, 6) increased involvement in writing their own curriculum materials, 7) positive changes in management of time and student behavior, 8) organization of their own research

investigations, and 9) the practice of checking for student understanding.

The listing of specific outcomes for students included. 1) improved attendance rates, 2) increased academic achievement, 3) better classroom products, 4) less misbehavior, 5) greater attainment of school goals, 6) achievement gains on criterion tests related to actual teacher objectives, 7) achievement gains on norm-referenced tests, 8) better problem-solving, 9) improved decision-making, 10) better use of resources, 11) better use of time, and 12) better evaluation of their own work and the work of fellow students.

Desirable changes in attitudinal and emotional states of teachers included: 1) improved morale/satisfaction, 2) more favorable attitudes towards school, 3) improved self-concept, 4) increased comfort with research language and procedures, 5) greater feeling of competence, 6) more positive attitude towards kids, and 7) increased enthusiasm.

The listing of desirable changes in attitudinal and emotional states of students included: 1) improved morale/satisfaction, 2) more favorable attitude towards school, 3) improved self-concept, 4) increased interest and motivation for learning, 5) increased independence and inter-dependence, 6) development of life-long learning habits, 7) improved attitude toward the subject, 8) improved perceptions of the classroom and of schooling, and 9) a clearer sense of their competencies and areas in which they need work.

A participant suggested that one should be able to observe changes in the ways teachers explain, rationalize, and defend their teaching practices. Another participant argued that the most important effects for teachers are related to changing conceptions of how classrooms work, to how well teachers adapt to changing circumstances and avoid mindless imposition of specific behaviors derived from teaching effectiveness studies.

Institutional Variables To Be Attended

Participants were asked to suggest institutional variables to be considered in the study, and to identify methods which might be used in studying the selected variables. The listing of variables included: 1) school policies, 2) leadership style used in the school, 3) resources available, 4) degree of local faculty autonomy, 5) conditions imposed by union/board contracts, 6) student composition of school, 7) student placement procedures, and 8) the achievement percentile rank in which students generally operate.

Suggested variables more directly related to a staff development study included: 1) the entry mechanism for getting staff development efforts introduced into the setting, 2) the ways teachers are rewarded, praised and promoted, 3) teacher load and previous staff development activity, 4) methods of teacher recruitment for participation in staff development activities, 5) quality and quantity of institutional support for discrete behavior change, and 6) institutional support for changes in the whole technical core of desired teacher behaviors.

The power structure, within and without the system, was suggested as an important institutional variable for consideration, along with the degree of experience of the participants in the staff development activity.

A few methods were suggested for studying selected variables: 1) examine personnel records, 2) interview teachers, and 3) examine notes from curriculum council meetings and department heads' meetings.

Procedures Suggested For Use In The Study

Various procedures were suggested for use in the RITE study. A case study method with a cross-case comparison was recommended so that a "deep description" would be both possible and manageable. The use of interviews

(student, teacher, administrator, parents), questionnaires and self-assessment instruments were suggested for collecting data. The recommendation was made that ethnographers familiar with teaching and clinical training be used in seeking to determine how someone like Jane Stallings knows what to focus on, how to use research findings, when to encourage teachers to visit other classrooms, and related points. One participant emphasized the need to use as much "process-tracking" as possible to determine whether all teachers get the same "treatment" regardless of need, or whether the "treatment" is adapted to each teacher. Another participant suggested that the dependent measure be an index of change, specific for each teacher or group of teachers, that could be collapsed for overall purposes.

Additional Suggestions

Participants were encouraged to share ideas and concerns regarding the issues which went beyond or were not directly related to the guidline questions. This section summarizes their additional comments.

The suggestion was made that RITE address a question which classroom research is only touching on: what happens after "stage setting"? Do practices of direct instruction foster or hamper later cognitive processing? Are long term goals sacrificed for short term gain? When is promotion of individual pupil effort essential even at the expense of social peace and quiet?

The RITE staff was urged to devote some effort to identifying student behaviors which might serve as an indication of the degree of match or mismatch between the needs of the students and the behaviors of the teachers.

A participant wondered to what extent a teacher's individual value system influnces what he/she wants to do in the classroom and his/her receptivity to change.

Concern was expressed regarding the instability of change itself. As teachers change and the classroom changes, behaviors which constitute effective teaching change. As the context or situation changes, the good teacher will adapt and so may not maintain behavior that was appropriate in the initial situation. This implies a need in data collection and interpretation to account for behaviors that have been appropriately dropped.

It was recommended that the RITE study be expanded beyond the usual and expected variables. The need to pay attention to teachers' decision-making processes was stressed, and RITE was urged not only to observe what teachers do but to attempt to understand why they do what they do. One participant asserts that an important precondition (and likely result) of effective inservice is a collegial "cell" or small affinity group which functions to sustain and support continued implementation. This cell will have important impact at the school level and may lead to other new forms of organizations which may substantially affect the political process up to the district level. One hypothesis put forward was that teachers feel a sense of threat to their self-concept when they are caught between the need to demonstrate certain specific teaching behaviors required by training programs and the need to function as inquiring, decision-making, sometimes error-making, interactors with the changing factors in the classroom setting. The RITE staff was urged to monitor these factors.

Summary Comments

In reviewing Time to Learn for the Elementary School Journal, Griffin, Webb, and Confrey (1981, p. 83) quoted Fenstermacher:

> In the absence of unattainable certainty about the best way to teach effectively, rules should be sparse, evidence plentiful, and schemata followed to wherever they might lead. This advice, taken seriously, would prevent one outcome that should not be the result of research: the conversion of research findings into ideology or dogma. Bridging with evidence and schemata avoids ideological and dogmatic interpretation.

Ideas and suggestions shared by the conference participants are consistent with this perception.

While recommendation is strong for the inclusion of findings from management and process-product studies in the content section of the RITE study, recognition is given to the tentativeness of this knowledge base. The RITE staff is encouraged to include the work of the developmentalists and such "craft" knowledge as can be articulated. Along with consideration of content on information processing, perception, and congruence between goals and student participation, the staff is encouraged to widen the scope of "content" to include useful knowledge that exists "primarily in the heads of creative researchers." The recommendations seem to direct RITE efforts toward the inclusion of findings from thorough and rigorous studies, with inclusion of work that is more tentative in the interest of expanding schemata.

It appears to be very difficult to list and describe specific discrete behaviors which one should promote in staff developers in order to produce appropriate and effective inservice activities for teachers. The recommendations for the RITE study in this area are more a listing of characteristics and results which a good staff developer might effect in teachers. Perhaps such characteristics as acceptance, supportiveness, high

energy, enthusiasm, faith in people, proactiveness, flexibility, genuine concern, and the ability to accommodate for change represent more a synergetic fusing of specific behaviors than a collection of behaviors. The idea seems to be that staff developers need to be able to do whatever is involved in the process of facilitating the growth or development of teachers and, apparently, that is to be determined by observing the circumstances under which teachers demonstrate development.

Certain institutional variables were proposed for attention in the study. Included among these were power structure, school and district size and resources, and nature of leadership. The composition of staff and student body, and the reward and promotion process for teachers were also identified.

The effects hypothesized for teachers and students as a result of effective staff development included both what the teachers and students would know and/or be able to do and their feelings or perceptions. Students should turn out better classroom products, i.e., read better, write better, and score higher on tests. Students should also feel better about themselves, their classes, and school in general. Teachers should organize and manage curriculum and student behavior more effectively. They should know more about research, be better planners and decision-makers, and enlarge their professional worlds. Teachers should also feel better about themselves, their jobs, and the students with whom they work.

Overall, the message to the RITE staff from the participants in the working conference was to base the research on staff development firmly on findings available from respected studies in relevant areas of teaching, learning, and change, but not to limit the possibilities of significant

findings by omitting key areas of concern because they do not presently have so firm a knowledge base.

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Reference

Griffin, G.A., Webb, N.M., & Confrey, J. Time to learn: Reviews from three perspectives. Elementary School Journal, 1981, 82(1), 76-94.

Summary of the Discussions

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Certainly among the most valuable portions of the Changing Teacher Practice conference were the discussion sessions. The stimulating character of the major papers together with the broad background and commitment of the conference participants contributed to the rich discussions. Three assumptions were held by all of the participants. First, there exists a need to change teacher practice. Second, the change is possible to accomplish. Third, the change should be based on research findings. The discussions hinged on the adequacy of current research and obstacles in the path to implementing change. This summary of the discussion will be presented in three sections:

a. Issues surrounding use of research as a basis for change in teacher practice.

b. Current knowledge base to address the issues.

c. Needed knowledge base to address the issues.

Issues Surrounding Use of Research as a Basis for Change in Teaching Practice

Characteristics of teachers and schools. It is prosaic, but nevertheless true, to state that the central figure involved in changing teacher practice is the teacher. The discussants recognized some of the characteristics of teachers and schools which have been discussed in the literature and which need to be considered when implementing change grounded in research. The classroom is a busy place, there is little time for teachers to deliberate over their reactions particularly to the more critical and potentially obstructive situations. In response to this pace most

teachers tend to seek only one solution to a problem or one answer to a question. Although teaching contexts vary greatly, most teachers have a preferred teaching style developed over a period of time. Teachers have generally been shown to be inflexible and somewhat resistant to change. These teacher and school characteristics were recognized as impediments to the implementation of change.

Traditional teacher reactions to research. An additional barrier recognized by the discussants was the traditional skepticism among teachers toward research and research findings. Some common responses of teachers were referred to by the conference participants. "My classroom (or my school) is unique." "I'm doing what you (the researcher) suggest already." "This is the way I've always done it and I have seen other teachers do it and it works." "There has been no research basis for teaching until now, why is it needed?" "Researchers do not know what goes on in the schools--they are not on the firing line." Craft, rather than research, has traditionally been the basis for teachers' decision making. The self-perception teachers have as being practitioners is in stark contrast to their perception of researchers as theoreticians. The conference participants fully recognized that bridging this gap has been made no easier by the poor historical record of integrating research findings into the classroom environment.

Current Knowledge Base to Address the Issues

What then is unique about the present time that made the conference participants believe it is now possible to change teaching practice? The current societal and economic pressures imposed upon the schools were rarely addressed by the participants, rather research reasons were the focus of attention.

Collaborative research as a socializing agent. The recent trend toward collaborative research has been influential. Increasingly teachers are involved as researchers in the planning and conducting of studies. Not only does this permit school personnel to share the ownership of the research, it also develops a more research aware cadre of teachers. It is assumed that, if teachers have been involved in the conduct of the research, other teachers will attend to the findings. Those teachers who have acquired research competence are able to present the research to other teachers in a format that is useful and viable. It was pointed out that strategies using teachers as conveyors of research off their own campus tended to be more powerful than using those same teachers on their own campus. This involvement in research is a socializing procedure and one which can be important in alleviating the traditional skepticism toward research.

Characteristics of some current research on teaching. Another factor which has created a greater receptivity on the behalf of teachers for change based on research has been the perceived practicality of some recent classroom research. Some findings may decrease the anxiety of teachers as they become involved in change activities, for instance those that suggest the importance of the teacher serving as the instructional leader in the classroom and being in control of the class. In the past many educators have suggested that the teacher adopt a non-leadership role thus increasing the necessity to take risks and in turn increasing anxiety on the behalf of the teacher. More recent research, however, suggests that teacher-directed classrooms are effective. Such instructional settings tend to place a teacher in a low risk situation and consequently generate less anxiety. Teachers are more willing to cooperate and modify their behavior when the change involves low risk and low anxiety. Other related findings were

described in a similar manner. The readiness to consider change based on research is reasonable when the research base is perceived by teachers as practical.

Emergence of a technical core for teaching. To many participants the present is the time for change because of the emergence of that which Williams referred to as the technical core for teaching. The technical core, derived largely from the teacher effectiveness data, was perceived as providing clarity for role descriptions for teachers and as a potential base for deteriming their competency. Considerable concern, however, was voiced regarding the too rapid integration into the classrooms of the technical core as currently defined. "Is the content of that core sufficiently compelling to merit implementation?", was one question posed. "Should researchers continue to contribute creatively to, and reflect on, the technical core rather than support the immediate adoption of the core in a change process?". Not only was the content of the core questioned from the aspect of completeness, but also from the aspect of generalizability. The context of the classroom and the wide range of conditions under which teaching occurs were identified as other factors which may need to be considered prior to wide scale adoption. More than one discussant, however, pointed out that while these caveats to change might be forwarded by academicians who wish to establish a sound base before implementation, school personnel view the core, as currently developed, as proving a starting point for immediate action. Regardless of the desires of cautious academicians the current technical core will be integrated into classroom practice. Maybe a more profitable concern is to consider methods by which the core might be integrated while minimizing the dangers from too hasty adoption of research findings.

Procedures for staff development. Assuming that implementation will occur, attention needs to be directed towards staff development procedures. In this area, too, discussants believed that at the present time knowledge is possessed about effective staff development strategies. In past years many staff development activities have occurred but there have been few long lasting effects. In this discussion the point was made that probably the most important factor determining the carry over effect of staff development is whether or not the individual believes that that which is being taught actually works for him or her. It was also suggested that variation in durability of different behaviors is a critical variable affecting application. Some behaviors can be taught relatively quickly and will be integrated into a teacher's behavior pattern immediately while others have to be developed over a longer period of time. It was suggested that the current state of the art is such that many teaching behaviors can be classified as being durable after a short training period (e.g., involvement of all pupils, not only volunteers, in classroom interactions) as opposed to those requiring long term training (e.g., changing group size dependent upon instructional variables).

Frequently the "mythologist" attitude to research--"I'm already doing it"--has been a problem for staff development and was addressed in this discussion as a possible deterrent to change. Providing teachers with data about their own actions based on observations in their own classrooms was highlighted as as means of countering this attitude. While teachers might believe they are incorporating certain strategies into their teaching, when confronted with videotapes of their own actions they can readily see that this may not be the case and are then much more willing to make changes based on the research.

Some attention was given during the discussion to the persons delivering the staff development and the nature of the sessions themselves. Generally projects have shown that interactive staff development activities are the most successful. Participants gain a sense of ownership in the new systems or behaviors being introduced and thus share in the desire for their successful and continued implementation. The use of different teaching strategies and varied technology in staff development sessions have been found to be important.

The consensus of the group was that once a staff development session has been completed a support system for teachers needs to be established. Since any change activities which are to be successful must have the support of the school administration, it is assumed that there will generally be a supportive environment for the teacher. Also important in establishing a high maintenance level is the continued presence of a model, the provision of follow-up boosters and the availability of opportunities for monitoring behaviors. Occasions were cited in which teachers, following staff development sessions, quickly believed that they had modified their behaviors and did not continue to reflect upon their teaching strategies. In these instances the teachers generally reverted quickly to their original behavior patterns.

Needed Knowledge Base to Address the Issues

Long term effects of implementation of current technical core. Considerable attention was addressed to two issues. First, if staff development is conducted to implement the apparently highly skill oriented technical core for teaching, will all teachers be moving toward the same 'ideal' model of a teacher? Concerns were expressed regarding the possibility of adjustments for differences in teaching and learning styles

that have been well documented. Some data would have to be gathered regarding this aspect of implementation. Second, and related, was the question, "What will happen three to four years from now if the current techniques suggested as effective are implemented in the classrooms?" Will those same techniques be effective? What effect will these changes have upon the schools? Once teachers have changed their behaviors in this manner, how flexible will they be? It is obvious that these questions were raised by some of the cautious academicians but it is equally obvious that these are questions that need to be addressed through continued research.

Related issues were raised by those persons specifically concerned with the initial and continued credentialing of teachers. "If a technical core can be specified should this form the basis for determining who should enter and/or remain in the teaching profession?" "If one aspect of the technical core is to be a consumer of research, when in the professional sequence should research skill be taught?" "When is the best time for involvement in collaborative research and what should the initial involvement entail?

Effect of increasing research sophistication of teachers. If research continues to be developed collaboratively, if change that is implemented is based on research, and if staff development is of an interactive character, then the level of research sophistication among teachers should increase dramatically. Although the discussants recognized this as a positive consumer outcome they also recognized the potential impact upon schools as a system. Currently teachers put little pressure upon the system to respond to research findings. Will this change? Will pressure be exerted by teachers? If so, what changes will occur?

Responsiveness to needs of individual schools and communities.

Considerable discussion focused around the administrative methods inferred from Williams' presentation. The traditional tension that exists between teacher and administrator was identified and suggested to stem from the lack of understanding which is implicit in the current hierarchical industrial model adopted by most school districts. Williams suggested that his approach would lead to an effective hospital model of administration, some participants questioned the appropriateness of such a model. The specification of a list of technical skills was perceived as developing a teacher who would be a technician and might thus create a "top down" model for change which might make non-functional those change processes involving collaborative designs. It was pointed out, however, that both the managerial system of a school and the change process as adopted are dependent upon the needs of the clientele and the specific school contexts under consideration. The specification of a technical core does not determine administrative style, but the effect it has upon the change process needs to be considered.

Basic to the system of education in the United States is the responsiveness of schools to the local community. The goals of teachers, parents and students need to be compatible. The current changing economy and accompanying stress on the development of skills to increase employability of the graduates are placing additional strains on this compatibility. As a result the discussants agreed that research which addresses teaching practice related to objectives held by all members of the triad (teachers, parents and students) is of great importance at the present. Furthermore, that is the research which will be received most positively by school personnel both as collaborators and consumers.

Impact upon staff development. Changing teacher practice requires staff development. While the discussants indicated many procedures they had found to be successful for changing teacher behavior they recognized a need for the articulation and refinement of generic and/or specific models for staff development. These models need to include a conceptualization of the roles of administrators and leaders in school systems as well as those for persons directly involved in staff development.

Much of the current progress in staff development has occurred in the area of mathematics and reading. The extent, however, to which a generic model can be developed from these activities has not been determined. Are the same staff development strategies successful at different grade levels and in different content areas? Unfortunately, a more basic question has not been addressed--"Are the same teaching skills effective in all content areas and at all levels of the school system?" This latter question is one which many of the discussants believed should be addressed before a generic staff development model can be devised.

Techniques for skill maintenance need to be identified and integreted into staff development. Self-monitoring by the teacher appears to be a productive process but procedures for developing the needed skills have not yet been, but still need to be, adequately developed.

Summary

The issues raised in the discussion related closely to those discussed in the remainder of the conference. They suggest a broad and optimistic agenda for both research and program development. Changing teacher practice in response to such issues would certainly lead to changes in the profession and the schools. Not until the present time has there been an organized and

developing body of knowledge providing such a solid base upon which research and program development can be initiated with confidence.

Appendix A

Changing Teacher Practice Conference Participants

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Appendix A (cont.)

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